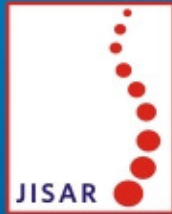


Jain Institute of Spine-care And Research

A unit of **Bhagwan Mahaveer Jain Hospital**



JISAR NEWS

QUARTERLY NEWSLETTER AND SPINE-CARE UPDATE

Cervical Pedicle screw fixation Transforming surgical approach in cervical spine surgery.

The Technique of Cervical pedicle screw insertion has been a challenging issue world-wide. This is due to the proximity of the cervical spinal cord and the vertebral artery on either side of the narrow cervical pedicles. However few Orthopaedic spine surgeons in Japan, Korea and China started describing the technique of cervical pedicle screw insertion and have been using them routinely without much complication. Till date cervical pedicle screws have not been used in most of the western countries.

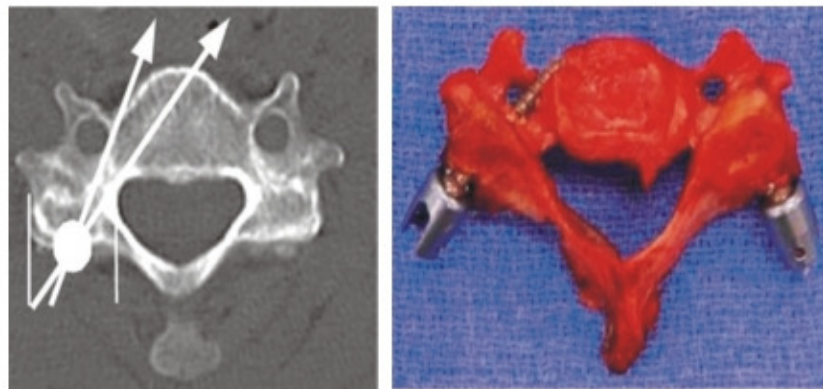


Fig.1: the Axial CT scan of cervical vertebra shows the narrow space available for placement of pedicle screw and the cadaveric model showing the lateral perforation of the screw with injury to vertebral artery.

As spine surgery is getting evolved as a leading orthopaedic speciality, Newer techniques are being tried and evolved in India also. At present very few centers in India are practicing this method. We at Jain Institute of Spine-care And Research have been using cervical pedicle screws for various disorders of cervical spine and have performed more than 20 surgeries using cervical pedicle screws. We present a few cases of cervical trauma showing the advantage of using cervical pedicle screws in this issue. We are also in the process of evolving a new technique for the insertion of cervical pedicle screws.



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Why do we need to use Cervical pedicle screws?

- ✦ The cervical pedicle screw fixation gives a significantly superior strength of fixation as compared to the lateral mass screws.
- ✦ It is the only device that provides fixation into all the three columns of the cervical spine.
- ✦ Cervical pedicle screws have transformed the surgical approach in patients requiring multilevel cervical decompressions, cervical Kyphosis with Myelopathy and in unstable 3 column fracture dislocations of cervical spine.
- ✦ All these patients usually require a combined anterior and posterior cervical instrumentation for proper stabilization of the cervical spine.
- ✦ With the advent of cervical pedicle screws all of these patients can be managed with a single stage posterior approach with decompression and rigid stabilization of all the 3 columns of spine.

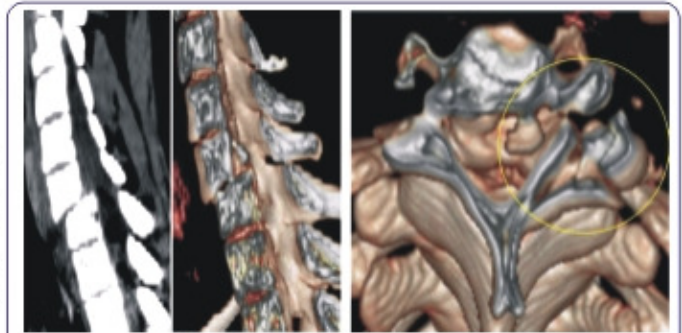


Cervical Trauma:

Case-1 : A 24 year male had a C6-7 fracture dislocation with facet fracture. He had weakness in extension of right elbow and no other neurological deficit. The CT scan showed fractured lamina and right facet compressing the C7 root.

The patient required decompression along with reduction of the C6-7 subluxation and fusion. The decompression has to be done from the back with unlocking of the facet joints for reduction of the subluxation. However due to the facet fracture, lateral mass screws cannot be used for posterior stabilization. The boy would require an additional anterior surgery for plating and fusion.

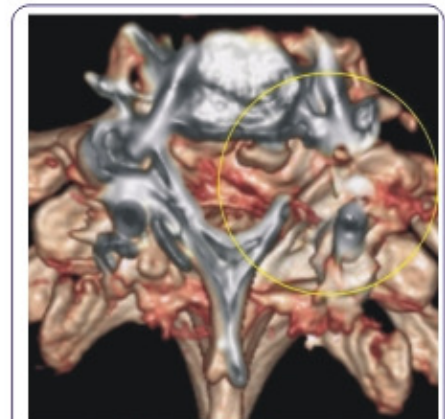
With the use of cervical pedicle screws we could achieve all the goals of the surgery from a single posterior surgery. The postoperative X-rays and CT scans show the reduction of the subluxation along with good decompression of the C7 right foramen. The boy recovered well from the surgery and was ambulatory on 2nd postoperative day. The elbow weakness recovered from 2/5 to 4/5 at 6 weeks postoperatively.



Case 1: CT scan showing C6-7 fracture subluxation with fractured right lamina and facet compressing the C7 nerve root.



Case 1: Postoperative X-rays and CT scan showing reduction of C6-7 subluxation with pedicle screw rod construct.



Case 1: Postoperative CT scan showing decompression of C6-7 foramen (fractured right lamina and facet compressed the C7 nerve root).



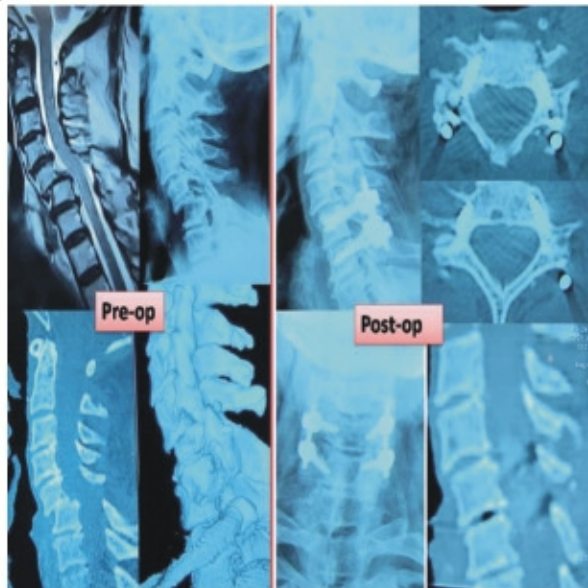
Case - 2

He was an 80 year old man with a C5-6 fracture dislocation without any neurological deficit. He came walking to our OPD with a history of fall a week ago and severe pain in the neck, supporting his neck with his hand over a cervical collar. His X-rays and CT scan showed

bilateral C5-6 jumped and locked facet joints. To achieve reduction and fusion of C5-6 we first have to unlock the facet joints from posterior approach. Since this involves partial excision of the facets, lateral mass screws cannot be

used at C5 and C6, so the patient again requires an anterior approach with plating and fusion.

However, with the use of cervical pedicle screws we could achieve complete reduction of the subluxation



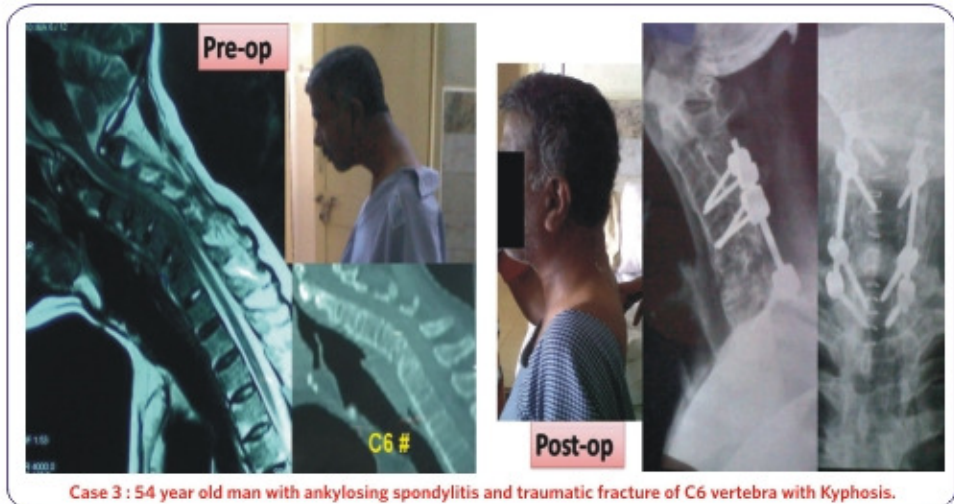
Case 2 : X-rays and CT scan showed bilateral C5-6 jumped and locked facet joints which was reduced and fixed with cervical pedicle screws by a single posterior approach.



with strong 3 column fixation by a single posterior approach only. This reduced the morbidity of surgery in this 80 year old man and he recovered from the surgery without any complications and was ambulatory on the second postoperative day.

Case - 3

He was a 54 year old man with ankylosing spondylitis and traumatic fracture of C6 vertebra without any neurological deficit. Patients with ankylosing spondylitis require rigid fixation of the spine due to the high stress concentration at the site of fracture caused by the long and stiff spine. Ideally both anterior and posterior cervical instrumentation needs to be done for a rigid 3 column stabilization of the spine.



Case 3 : 54 year old man with ankylosing spondylitis and traumatic fracture of C6 vertebra with Kyphosis.

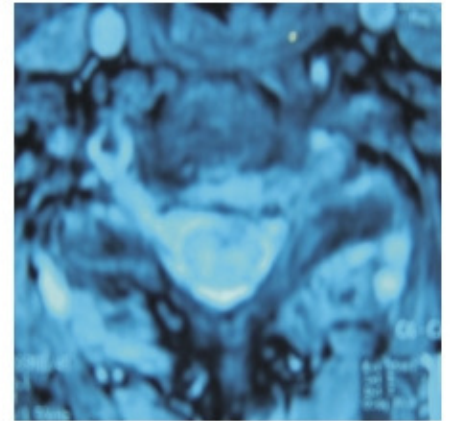
However with the use of cervical pedicle screws we could achieve a rigid 3 column fixation of the spine along with correction of the Kyphosis at C6 fracture by a single posterior approach. The patient was ambulatory the next day of surgery without any deterioration in neurological status. The CT scans at 10 months follow up shows the Kyphosis correction and fusion without any fixation failure.



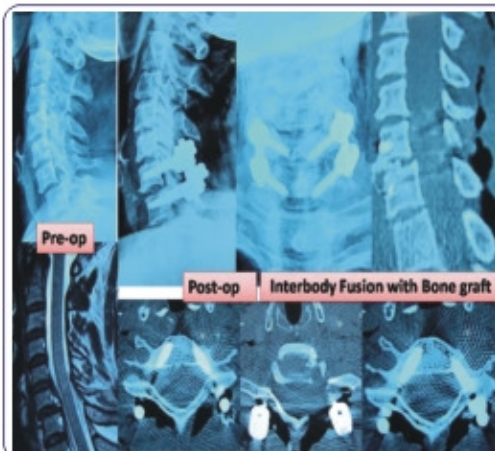
Case 3 : CT scans at 10 months follow up shows the Kyphosis correction and fusion along with accurate placement of cervical pedicle screws.

Case - 4

She was a 54 year old lady with injury to cervical spine and fracture subluxation of C6-7 with weakness of left elbow extension. There was C6-7 left posterolateral disc extrusion causing severe compression of the left C7 nerve root. We went ahead with posterior pedicle screw rod instrumentation to achieve C6-7 reduction and fusion. We did a transforaminal left sided discectomy and interbody fusion with bone graft for decompression of the C7 nerve root similar to the Transforaminal Lumbar Interbody Fusion (TLIF) done commonly in the lumbar spine.



Case 4 : MRI showing C6-7 left posterolateral disc extrusion causing severe compression of the left C7 nerve root.



Case 4: X- rays and scans showing posterior pedicle screw rod instrumentation with C6-7 reduction and transforaminal interbody fusion.

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Tips and Pearls

- ❖ Cervical pedicle screws have transformed the surgical approach in patients with cervical spine pathology.
- ❖ Most of the cervical spine pathologies can be addressed by a single posterior approach with the use of cervical pedicle screws.
- ❖ Cervical pedicle screws can be used safely in the fixation of cervical spine with proper training and meticulous technique.
- ❖ Cervical pedicle screws are still not used in the west but are routinely used in Japan, china and Korea. Only few centres in India are using cervical pedicle screws at present.

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